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it is not fair towards the gentleman who gave me that information, and whose hospitality in the desert I gratefully acknowledge, to anticipate in any way the publication of discoveries which rightfully belong to him, and which, I trust, he will himself ere long communicate to the world.

11.—*Account of the Ascent of the Camaroons Mountain, in Western Africa.* By Captain RICHARD BURTON, H.B.M. Consul at Fernando Po, Gold Medallist. (Communicated by the FOREIGN OFFICE.)

*Consul Burton to Earl Russell.*

Fernando Po, February 22, 1862.

MY LORD,—I have the honour to report that I have made two ascents of the hitherto unexplored Camaroons Mountain, and have discovered a magnificent site for a sanitarium, a convict station, or a negro colony. I have enclosed a report, to be forwarded, if your Lordship thinks proper, to the Secretary of the Royal Geographical Society.

I have, &c., (Signed) RICHD. F. BURTON.

(Enclosure.)

*A Reconnaissance of "Theon Ochema," Camaroons Mountain.*

"Τέτταρας δ' ἡμέρας φερόμενοι, νυκτὸς τὴν γῆν ἀφεωρώμεν φλογὸς μεστήν. Ἐν μέσῳ δ' ἦν ἡλιβατόντι πῦρ τῶν ἄλλων μείζον ἀπτόμενον, ὡς ἐδόκει, τῶν ἱστωρῶν. Τοῦτο δ' ἡμέρας ὅρος ἐφαίνετο μέγιστον Θεῶν ὄχημα καλούμενον.

"Post cursum dierum quatuor, noctu terram conspiciebamus flammis refertam. In medio autem erat excelsus quidam et ceteris major ignis, ipsa, uti videbatur, tangens astra. Is interdū apparuit esse mons altissimus, qui Theon Ochema vocatur."

[This remarkable passage in Hanno's 'Periplus,' chap. 16, is to be explained only by the firing of the grass and the burning solfaterra on the Camaroons Mountain.]

THE Royal Geographical Society may, at first sight, not be disposed to think much of an exploration which appears only to have reached a mountain district 14 miles of direct, and 21 of indirect distance from the sea. But a little knowledge of the subject gives another view of it. Water is often wanting; provisions are never to be found on these tropical heights. The wild people are a notoriously bad, though cowardly race, and everywhere, as the late expedition to Kilimanjaro proves, if such proof be required, savages are unwilling to see their mountains ascended for the first time. Add to this, that the only escort in these lands must be krooboyes—sturdy fellows, but the most arrant poltroons. They hate land-work; they mangle by inducing sore feet; they run away; and at the best of times they are fond, as Murphy is, of depending on Pat to ask Corny to think about coming some day and help to carry a small bundle of straw to repair the roof.

For nearly four centuries this magnificent pile of mountains, the "Theon Ochema" of Hanno and Pliny has been looming before the eyes of the passing European mariner, yet the summit has been ever virgin. Two attempts have lately been made. In 1847 a Mr. Merrick, of the Baptist Mission on the Camaroons River, succeeded in emerging from the forest into the open grassy levels. But pure water failed him; his people suffered from cold and thirst, and he was compelled to return. Two years afterwards he died. In 1860, M. Gustav Mann, a young Hanoverian botanist, travelling and collecting in West Africa under the patronage of Sir William Hooker, ascended a few hundred feet, when press of time persuaded him to stop. Here, then, remained for me a mountain whose "glorious pinnacle never yet felt the foot of man."

Geographically speaking, the Camaroons Mountain is a parallelogram laying

between  $3^{\circ} 57'$  and  $4^{\circ} 25'$  north latitude, and  $9^{\circ} 25'$  and  $9^{\circ} 1'$  east longitude. It is bounded on the east by the Bimbia River, a stream probably discharged by the mountains. The western limit is a branch of the Rio del Rey, or Rumbi River. The Atlantic washes the southern face, and the area towards the north still wants exploration. The distance from the southern foot to the summit, as laid down in the charts, is 14 miles; allowing the same for Country Cape, 28 miles will be its length; and its breadth from the Bimbia to the Rio del Rey is not less than 24 miles, forming an area of 600 square miles. Captain Owen, R.N., estimates the diameter at nearly 20 miles, which would give an area of about 314 miles; but he does not include the high lands to the north-east, extending to the Rumbi range.

This huge volcanic mass is one of a long line of basalt islands, beginning at the unexplored Rumbi range, and stretching from  $33^{\circ}$  north-east to  $33^{\circ}$  south-west through Camaroons, Fernando Po, Prince's Island, St. Thomas', and Ascension. It occupies the bottom of the Bight of Biafra, in the very centre of the Gulf of Guinea, where the coast of Western Africa—after that long sweep eastwards which made the later classical geographers shear off the vast triangle south of the equator—bends almost at a right angle towards the Antarctic pole. The lands behind it being still unexplored, it is difficult to say whether this basaltic buttress to the Atlantic waters does, or does not, communicate through the Rumbi Mountains with those West African giants, the Sierra del Crystal. On the other hand, it may be connected by the Kwa Hills to the north-westward, and by the Bassa Mountains upon the Niger, with that mass of high ground east of Sierra Leone, and known upon our maps as the Kong Mountains.

My first visit to Victoria—the little missionary station whence the ascent was to be made—was on the 10th December, 1861, in H.M.S. *Bloodhound*, Commander Dolben. There I found Mr. Mann eager to begin the journey, but still “palavering” with the petty chiefs on the road. An official visit to the Camaroons—an odious “trust river”—procured another volunteer, the Rev. A. Saker, for eighteen years a resident in these parts, a linguist and ethnologist highly respected by the people. Returning to Fernando Po to complete the outfit, for which four days sufficed, I had yet another volunteer for the expedition, which gave it an international character. Señor Atilano Calvo Iturburu, Assessor or Assistant Judge and Secretary to Government, Fernando Po, was as weary as myself of “palaver,” and at least as anxious for a mouthful of fresh air. You must not confound him with certain awful personages in pepper-and-salt wigs and ample gowns, but rather think of him as a fast young pig-sticking Anglo-Indian magistrate.

The dawn of the 18th December found Judge Calvo and myself lying in H.M.S. *Bloodhound*, off the lovely Bay of Victoria, where Mr. Saker was awaiting us. Mr. Mann had set out in advance to await us at the highest village, and we were to follow on the next morning. Precisely at 6 A.M., as agreed upon, we arose, despite the ravages of mosquitoes and sand-flies, and fifty minutes afterwards found ourselves *en route* with a hurrah! The party consisted of Mr. Saker and his two kroomen, who carried his bed, his bunker, and his carefully-locked box of creature comforts—the veteran traveller never lost sight of his fellows. He was accompanied by the interpreter, Mr. Johnson, who having begun life as a factotum to Governor Beecroft, had settled down in his old age as a teacher in the Camaroons Mission. Judge Calvo's escort was composed of four kroomen—all of them hopeless convicts from the cuartel of Fernando Po—and King Eyo, a youth whose idleness and uselessness were admirable and exemplary even in Africa. My party consisted of six krooboyes under their head man, Black Will. They were placed in charge of my steward Selim Agha, an invaluable man, a native of Tegulet, and a protégé of the late venerable Mr. Robert Thurburn, of Alexandria. He had spent a dozen years of his life at a school in Scotland, where he learned to cook,

doctor, spin, carpenter, shoot, collect specimens, and stuff birds—briefly everything.

Our route lay through a bush—such is the magnificent Anglo-African term for a forest of trees often 100 feet high—composed of palms and acacias, a variety of figs and cardamoms, the kola-tree (*Sterculia acuminata*), and three kinds valuable for timber, namely, the African oak (*Oldfieldia Africana*), the scrubby oak of Sierra Leone (*Sophira alata*), and the brimstone-tree or yellow wood (*Mormida lucida*). This also is the region of huge grasses which extend to 4000 feet above sea-level, where dwarfened growths take their places. The whole of this country is admirably adapted for cacao (*Theobroma cacao*), coffee, and sugar; it is a pity to see it wasted on plantains and koko (*Colocucia esculenta*). We twice forded the bright little mountain-stream which supplies Victoria with the purest water, and ascended some tough heights, passing west of Mount Henry—a site which I at once fixed upon as a provisional sanitarium, to be prepared before the grand institution near the summit of the mountain. After four hours—2h. 20m. of actual walking—we entered the settlement of the Chief Miyombi, passed some outlying huts, and halted for breakfast at Bosumbo, the head-quarter village, lying 23,420 feet from Victoria. These and other distances were measured by my factotum Selim, with a line supplied to me by Lieutenant Dolben. At Bosumbo Mr. Saker's French aneroid showed 29.6, and Mr. Mann's B.P. apparatus gave 210.5°; temperature, 67.5°.

We now stood upwards of 1000 feet above sea-level, and at noon merrily resumed our way. The path, a mere rut, led through dense bush and grass, with a general northerly direction bending westwards. After passing through a somewhat populous district, we entered upon a vile series of rocky ridges, separated by ravines, and impassable during the rains.

At 4.30 p.m. we made Mapanya, the district of the Chief Botani, and the highest village on this part of the mountain. It lies 17,300 feet from Bosumbo; the aneroid showed 28.23, the B.P. 207.5°; temperature, 72.5°.

The first person we saw was Mr. Mann, who at once informed us that he had just returned from reaching the summit. Faces fell at the announcement: it had been understood that he would wait our arrival. Presently we were reassured. The time of his walking rendered it impossible that he could have been near the mysterious spot. Eventually it became clear that he had never seen his bourn.

The next trouble was the ceremonious welcome with which we were received. The Chief Botani, a yellow man with a bright blue pair of tattooed regulation-whiskers, appeared before us in his royal garb, tall black tile, old scarlet and gamboge coatee of Royal Marines, and a pocket-handkerchief. Thus habited he performed a lively dance, apparently borrowed from the movements of excited poultry. I did not enjoy it. In Africa, when the King dances you have to pay for the honour.

Mapanya is the usual Bakwiri village, a single street separating four huts on the northern from two on the southern side. The site is a little clearing, well grown with plantains, and backed by a glorious screen of wooded heights. The huts are oblong, with pent roofs. The walls are of wattle, supported by posts of the strong and fibrous tree-fern, and provided with sheets of bark to keep out the wind. The roofs are thatched with palm-leaves. The inner space is divided into three "pieces;" at one end of the long walls is a closet, partitioned off by posts and party-walls; the centre, where the only door is, represents the hall; whilst the other third is devoted to the fire-place, with a platform above it for storing and drying wood. The ceiling is black, as if painted with coal-tar, and the floor, which ignores a broom, is at once the chair, the bed, and the resting-place of man, woman, and child, goat and sheep, pig and poultry, to say no more.

The tribe to whom this part of the mountain belongs is called in our charts

Bakwileh. The proper word is Bakwírí, from "kwiri," a jungle, and meaning literally Boyesman or Bushman. They are allied in language to Ilubu, or people of Bimbia, and their dialect is a branch of the great South African family, whose type is the Kafir tongue. The Bakwírí are a light-coloured race like the Bubis of Fernando Po, and have well-made legs, like mountaineers generally. They bear a bad reputation; they are harmless only because each village of five huts has a "palaver" with its neighbours, and because the poison-ordeals sadly thin their numbers. They can hardly be persuaded to part with their flocks, or even their poultry, except by the inducements of rum, a tall hat, or an English shirt. Mr. Mann's scarlet blankets excited, however, the utmost admiration. The people offered successfully in exchange for one, a pig and a goat, a small boy, and a large girl.

We halted at Mapanya on the 20th December, having sent the krooboyos to Victoria for a reinforcement of provisions. A lively scene met our eyes at 2 P.M. The dancing Chief Botani had been "dashed" by Mr. Mann, and had received a similar present from me. Not content with that he demanded more, which was refused. Then he and his followers, drunk with "bilám," or trade rum, attempted to seize Mr. Mann's interpreter, a child known as "Poor Fellow." They drew their long knives, and had laid forcible hands upon the little wretch, when Mr. Mann energetically rescued him. Upon which the war-drum was beaten, the women began to leave the village, and the men to flock in. Mr. Saker being unarmed, there were only three of us, and the fun soon became fast and furious. We stood to our weapons, and occupied the doorways of the huts so as not to be taken in rear. Presently the fumes of the rum ceased to affect their brains, and all excitement disappeared—Botani, the Chief, wearing a very hang-dog look.

The next day, however, matters were worse. Our kroomen returned from Victoria, accompanied by the Chief Miyombi, of Bosumbo, much the worse for liquor. On being refused more rum he persuaded Botani to demand 500 "big tings," *i.e.*, 500*l.*, for his gracious permission to ascend a place upon whose top cloth would be found growing. The demand was lowered to 300*l.*, when we laughed in his face. He then ordered us down the mountain. We showed our guns, and told him that we should start up the mountain that day. Botani then declared that he would allow no carriers to accompany us. We had loads for twenty-five men, at least, and there were only fourteen: so he retired to another village, and quietly waited there to hear of our failure.

A little after noon, Messrs. Saker and Calvo set out with fourteen kroomen, and reached a place in the forest which was afterwards called "Ridge Camp." The bearers were then sent back, and only nine came, causing us a trouble which brought back to my mind bygone days in East Africa. Shortly after 5 P.M. we effected a start. The distance is 6000 feet, and there are five very bad ascents. The road is a copy of that leading to Mapanya—high pitches, ladders of rock and root, tall grasses, ridges, hollows, scrambling-places, nettles, and legions of biting ants. The palm had disappeared near Mapanya, and now we saw the last of the plantain, and the first of the graceful tree-fern. As darkness was imminent, we heard shouts above us, and those who had rested came down to assist the wearied. I arrived at 6.30 P.M., and Mr. Mann shortly afterwards brought up the rear of his luggage. At Ridge Camp the aneroid showed 27.2. We passed a comfortless night in the forest. The inhospitable Bakwírí had refused us water, the ground was uneven, and the total loss of rest was a bad preparation for the hard day's work that awaited us.

Before dawn on the 22nd of December we left Ridge Camp, made a cache for our extra loads, and determined to reach water before the night. The real march began at 8 A.M. The characteristic of the scenery now was the fern—fern, fern, everywhere. Some were like palm-trees, 10 to 20 feet high, surpassingly fair to look at; others were dwarfed epiphytes, springing moss-

like from the arms of their parent trees. There were beds of ferns upon the ground, and others running creeper-like up the trunks. Never had I seen a more beautiful fernery, set off as it is by the huge tropical growth around it. The path, however, was vile.

After 2510 feet, which consumed a good hour of our valuable time, we passed under a natural arch of fallen trees, which we called "Fern Gate." The B.P. here showed  $120.4^{\circ}$ , the temperature  $66^{\circ}$ . Beyond it lay a new land. Bush and forest suddenly ceased as if felled with the axe; and, O, joy! we had emerged from the regions of the tall grasses. Nothing met the eye but a broad green slope of small moss and larger fern, all of it the *F. nephrolapis*, based upon a rugged bed of old and degraded lava. We called this first stream Lava Bed No. 1, and specimens of it, and of the other fire-rivers long since quenched, have been forwarded for the inspection of a certain ex-President of the Royal Geographical Society, whom it were needless to name here. The direction of the bed is from  $291^{\circ}$  to due north, that is to say, it has flowed from north to south with a little easting. I afterwards found this a rule which safely guided us to the topmost peak. The craters may open irregularly and in all directions, but the lava-flow follows the direction of the wind. More expert volcanists will determine if there be any connection between the two facts. The breadth of the bed may be half a mile; the lower part finding little slope thins out, and ends in a dense forest. The banks are girt on both sides by giant trees; and looking down from the half-way heights, the idea of a huge fir\* is suggested.

Having breakfasted and eaten blackberries (*R. apetalus*), we began the ascent at 9.50 A.M. The hunters' path led up the western edge of the lava-river, and gradually curved to the eastern. It was severe work: six particularly steep pitches presented themselves, and the way often wound up prisms of lava from 15 to 25 feet high. In the lower part, where the blocks cannot be seen, there was imminent risk of spraining an ankle. Higher up, the ascent became more rocky and bare. *Salvia* scented the air, and the surface was spangled with blight blossoms unknown even to our expert "botaniker." There was also heath, but, ah! how different from what you understand by such word—an *Ericanella* 15 feet high, thin and rugged as an old tamarisk. The bees now began to settle upon us, but no one was stung. As we ascended, the heat of the sun became terrible. The kroomen tailed off; Selim Agha remained behind in charge of them, and verily I believe saved several lives by squeezing water out of the thick mosses that hung from the banks.

The last third of the road is the most rugged of all. The bed now nears the place whence it issued, and the unequal cooling of the masses has made it uncommonly rough walking, or rather climbing. You look up and see a high, abrupt, and broken transverse wall; you reach this in half an hour, more than half-exhausted, and you see nothing but another. I found it impossible to keep my eyes open; something fiery and feverish had got into my veins. So requesting my companions, who were far fresher, to keep going, I lay down upon a lava block, slept soundly for an hour till 4 P.M., and was thus able to finish the ascent.

Lava Bed No. 1 issues from a dwarf cone which, from its exceptional darkness, we called "Black Crater." It is a punch-bowl, opening towards the south, long extinct; the western lip rises 200 feet from the level platform below, or 356 feet measured along the slope. The crater is about 100 yards in diameter, and the circumference of its middle height may be 600 yards. The outer surface is fine cinder, mostly bare, very sparsely overgrown with now dry grass and with stunted shrubs, and there is a little green vegetation

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\* Manuscript illegible.

inside the crater. It is distant 8350 feet from Fern Gate. The B.P. showed 200.2°, the temperature being 63.25°.

Mr. Mann kindly volunteered to set out with a krooman, and to bring back a beaker of water. His offer was accepted by a most grateful public, and we afterwards named the fountain which an old Mokwiri had shown to him "Mann's Spring." Without such discovery, indeed, our work would have been trebled. By degrees our kroomen appeared with bed and baggage; five of them, however, remained behind. Another bad camping-place had been selected. The high north-east wind roared over us all night, and a change from 78° to 40° Fahrenheit in a few hours is a severe trial of strength. Even at 6 A.M. the mercury stood at 48°.

A lovely morning, when the large red sun had

"Retinged the dark and livid air with bloom,"

made amends for past troubles. Before us, beyond a grassy hollow, about one mile broad, rose, separated apparently by a great gulf, the awful form of Mount Trestrail, stern, solitary, and rising one-third higher than Vesuvius, without neighbour or rival. The charts give it 5820 feet. Captain William Allen calls it "Mongo Mt. Etindet," which would mean the "separate mountain," but Mr. Saker had never heard the word.

As Selim Agha and his squad did not appear at 2 P.M., we sent them a beaker of water, and set out for Mann's Spring, distant 9594 feet. Our direction was northerly, with a little westing. The walk is charming by contrast, winding round the grassy shoulders and folds of various hills. On the right we passed a crater, whose double effusion of lava united at the base, inclosing a clump of vivid verdure, probably the *Hypericum angustifolium*, a European growth which had now become common. The path, a mere rut, struck, after forty-five minutes, into a thickly-wooded ravine, nearly the highest limit of large vegetation. After the fiery sun there was pleasure in its cool shade, and its air scented with a garden of blue labiates and white clematis hanging from lofty trees. The forest, except where herbaceous plants clothed the ground, rather resembled an English wood than an African jungle, and the birds twittered from morning to night upon the moss-bearded branches.

We at once paid a visit to Mann's Spring. It is a little runnel of pure cold water, issuing from peaty earth, at the foot of a small rock-bank, and sinking into the dark brown mould beyond. It is embowered in blue flowers, and surrounded by nettles, which supplied us with a Scottish spinach. A few yards from it the kroomen had cleared a slope for our camp: we expected even then to remain here for some time. Shortly after our arrival all the stragglers came up, happily without an accident, except some chafed feet, which they afterwards improved into laming sores. At Mann's Spring Camp the B.P. ranged between 199.5° and 200°, temperature 65°, which would give it in round numbers 7000 feet of altitude. It is in the Tierra Temprada of this mountain, where the wooded lands of the Caliente climate below touch the Pays Brulé, the Tierra Fria, above. During a residence there, lasting from the 23rd December, 1861, to the 31st January, 1862, I made up my mind that it would be an admirable spot for a Sanitarium or a Colony. Materials for a road and for house-building lie all around. Of the 60,000 runaway negroes in Canada give me but 300, and I will make a path practicable for mules at the end of a dry season. Pestilent Lags will require a "sick bay," and where can a Lebanon be found equal to the beautiful, the majestic Camarouns?

Christmas-eve and Christmas-day were spent in taking bearings, and rambling about the hills, and in naming the places. According to Captain Allen the Bimbia people call the topmost heights "Mongo Ma Lobn," or the Mount of Heaven. We loyally christened them "Victoria" and "Albert," being then ignorant of the awful event which had destroyed Christmas merri-

ment in Old England. As the natives have no distinguishing terms for the several heights, we thought it not ungeographical to seize the opportunity.

The ascents of "Earthwork Crater," so called from its extreme regularity of outline, and "Mount Helen," in honour of Mrs. Saker, who had supplied the Christmas plum-pudding, showed us a wonderful prospect. The mind was thrown back upon the wild scenes that Nature must have worked here. A wondrous confusion reigned around. A vast circle of thick white cloud, iridescent by the sun, and careering round and round us whilst we were standing in limpid air, forms a setting for the tumbled mass of craters—we counted twenty-eight—gashes, deep crevasses, thick lava-beds, and ribs of scoriaceous rock, marshalled in the region before us. But after a brief *coup d'œil*, every eye was turned from the lesser to the greater giants northwards, where, clear and distinct in the thin air of morning, rose the grand presence of the Peak. It was manifestly divided into a pair of distinct heads, which at once suggested the two most fitting names. The deep metallic blue that invested the monarch of West African mountains, compared with the brown, dotted with points of blackish verdure, on the nearer rocky parallel, suggested that a chasm would separate fore from back ground. The idea proved, happily for us, erroneous.

On Christmas-day, 1861, Mr. Saker left us for a season, his presence being required at Victoria. Mr. Mann had been confined to his hammock for some time: the Judge and I therefore determined upon a reconnaissance of the Great Mountain; and at 5.30 A.M. on Friday, December 27, 1861, we set out, accompanied by three kroomen, upon our eventful walk.

Emerging from the forest that clothes the base of Earthwork Crater, we found ourselves on the grassy tract, and presently saw Mount Helen bearing  $75^{\circ} 25'$ . After about 2000 feet we came upon a bed of lava, which we called No. 2. Following it up we arrived at the base of Mount Helen, distant 7814 feet: here the B.P. showed  $198^{\circ}$ , temperature  $66^{\circ}$ , whilst on the summit it was B.P.  $195.4^{\circ}$ , temperature  $57.5^{\circ}$ .

Having enjoyed a pipe under one of the few wind-rung trees that dot its south-western side, we struck over a long grassy and rocky reach of mountain slope, separating us from a magnificent mountain, which, as a dutiful husband, I had named Mount Isabel. Its distance from Mount Helen is 8648 feet, and the B.P. was  $193.75^{\circ}$ , temperature  $60^{\circ}$ . We then ascended a steep cone, after which a kind of *terre pleine* led us to a sheltered spot, which we judged well fitted for a *dépôt* of water and for breakfast.

Before us northwards, however, was a spectacle that robbed me of appetite; there, straight in front of us, they rose in ineffable majesty—those towering peaks,—tangible, as it were, in the morning æther. There was no chasm. Beyond the base of Mount Isabel the ground swelled gradually upwards, forming a labyrinth of green-black lava-streams, and a congeries of grass-grown craters extending up to the main cone. A faint verdure seemed to streak the eastern slopes, which were far less abrupt than the western; a long and highly-inclined sweep of blue—the effect of fine black cinder—separated Victoria from Albert Mountain; and whilst the latter showed a distinct but small crater, the former was beautified with descending stripes of red and yellow, falling, as it were, from a cliff or niche a few feet below its apex.

I seized the Judge's arm, and urged an instant advance. He meekly shook his head, and referred me to my breakfast, which stuck in my throat. Our krooboy had required driving the whole morning, and with increased fatigue I expected a rare afternoon.

At 10.30 A.M. we arose once more, with an uncommon elation of spirit: "excelsior" being now the word. The direction—path there was none—lay along the steep side of a hill, where we walked upon the edges of our feet. After a quarter of an hour we had reached, at a running pace, Lava Bed No. 3. It issues from a crater below, and south-westward of, the main peak. Appa-



rently the oldest formation, the material is overgrown with dry green moss, and crumbles like pumice under the tread. Turning the head of the stream which is suddenly arrested by a rise, we followed a smooth groove along the eastern flank of a small cone on the proper right, and then struck across the bed towards another on the left of the lava-river. The passage occupied half-an-hour. The mossy part was 800 feet broad, and the last 400 feet stretched over a stream of ruddy-black clinkers, detached stones, hard and rough, which caused torture to our feet. I afterwards observed the same formations to extend under the friable outer coat of lava. Meanwhile the contrast of the small dark vein with the large, soft, green artery is curious in the extreme.

At 11.30 A.M. we reached the cone on the proper left of the stream, much encouraged by seeing that we were sensibly nearing our destination. After a ten minutes' walk along its clean-cut edge, encumbered only by tussocks of wiry yellow grass, we found ourselves again compelled to cross the same lava-river higher up the bed, where, though narrower, it is far more ridgy and broken, being near its source.

This second passage led us to what appeared to be two grassy cones, which lie at the foot of the grand crater. Not knowing that they were outliers disconnected with our destination, we thought proper to ascend them. It was the last straw that broke the Judge's back. The incline was unusually steep, the surface stiff grass, and patches of hot black scoriæ; and the sun was oppressive. After a painful clamber we reached the summit, and found that the two cones were one, with a central depression. We stood on the rim of a beautifully defined crater, narrow and edge-like at the top, about 100 yards in circumference, sloping inwards like a punch-bowl, and grass-clad to the very floor, which was a jetty pavement of fragmentary lava.

There, after that waste of labour—the cone could easily have been rounded—we allowed ourselves to rest for fifteen minutes by the watch; we abandoned ourselves to the charm of the situation, and made eternal silence vocal with a cheer. We were the first Europeans certainly—probably the first men—who had ever stood within gunshot of the giant sugar-loaf whose now-extinguished fires caught the old Carthaginian's gaze.

We then debated upon the mode of ascent. The Judge preferred the long eastern shoulder, which was green with lichens, as being the easier. I preferred to breast Victoria Peak by the nearest path, towards the red and yellow fire-tinged scoriæ, and to leave on the left the smooth steep black slide of dust-like lava that, separating the two eminences from afar, wore a blue tinge. At 1 P.M. we began by walking round the crater of the grassy cone; here, however, the Judge stopped. Looking at the wall before him—I afterwards found by measurement that it measured 3300 feet along the slope—he judged it beyond his powers, and advised me to reserve it for another day. Subsequent events almost make me regret that I had been less obstinate. But on second thoughts—no! to be the first is everything; to be second is nothing.

Descending the tufted cone I began the last ascent, accompanied by a single krooboy and by a flask of anisado and water, which the Judge had kindly lent to me. At first the walking was easy, and the slope gentle, but the loose cinders caused fatigue by slipping from under foot. Arriving after a long elbow to the left at blocks of basalt, which we afterwards called "Half-way Rocks," I turned to the right, and, steadily keeping the red and yellow cliff in sight, ascended along the ragged edge of a little ridge, which afforded mossy lava to support the tread. In places there were thin scatters of a quartz conglomerate, which I never saw except upon that cone. The sun was fiery, and the high north-easter left its marks upon me for a fortnight afterwards.

At 1.30 the easier slope was surmounted, and walking became so troublesome that I preferred an occasional "all-fours." As we neared the summit my krooman sank down with thirst-glazed lips, and he was allowed to remain

behind. A few moments more saw me upon Theon Ochema, where a new and unexpected set of objects met my sight.

Victoria Peak I now discovered was but the outer walls of a double crater, black, and, to judge by the eye, 250 feet deep, opening southwards, where it has discharged a prodigious lava-stream, and divided into two by a thin partition-wall. Unable to boil at that visit, I afterwards found the mercury rise to  $193.5^{\circ}$ , temperature  $60^{\circ}$ , at the base; and at the summit of Victoria Peak  $189.75^{\circ}$ , temperature  $59^{\circ}$ . Mr. Saker on one occasion made B.P.  $188^{\circ}$ , temperature  $59^{\circ}$ ; but I am disposed to doubt this observation. To the north-west of Victoria Crater lies Albert Crater, a far smaller formation, but remarkable for its high back wall, where the B.P. was  $189.5^{\circ}$ , temperature  $59.6^{\circ}$ . The two craters are parted by a curious V-shaped dyke of compact greystone, in large blocks, like a ruined Cyclopean wall, and 25 feet high. To the west-north-west of Albert Crater, and divided from it by a jagged wall of basalt, lies Prince's Crater, by far the smallest of the three.

But these were subsequent discoveries. Time forced me to be content with a cursory look at Victoria Crater. By way of recording my claim, I made a little cairn of stones. The krooboy had rejoined me with the B.P. apparatus, but the others had lagged behind with my poncho. The furious north-easter charging round the black summit threatened to make a Phaeton of me—to sweep us like flies off the peak; and after sundry attempts I desisted, promising myself better luck next time.

In such doings 2.30 P.M. had sped: there was a reverse to our bright medal, a night in the wild and open. The descent of the cone occupied half an hour. I tried the Vesuvian style of gravitation, and found the cinders so loose and the slope so great that a wreck upon the boulders studding the base was imminent. This descent occupied thirty minutes, and when I threw myself down to rest at the foot it was already 3 P.M. I had taken upwards of seven hours to finish off the five miles of ascent, and still hoped to effect a return in three hours.

I hurry over the homeward march. Arrived at Mount Isabel we refreshed exhausted nature, and hastened on after a ten minutes' halt. A wind was already blowing, which sent the mercury to  $40^{\circ}$ . Shortly after 6.30 P.M., as we passed our guide and beacon Mount Helen, a cloud-bank was all we could see in the west. The pace now became frantic: twilight, though longer upon the mountains than in the plains, is short. Before 7 P.M. we were surrounded by a darkness that could be felt. We were compelled to halt. The kroo cry, however, at last brought a response, and presently we saw fire-sticks—the excellent Selim being as usual to the fore—making their way towards us. The cold night-wind whispering pleurisy kept us moving till assistance came, and we reached camp at 8.30 P.M., instead of 6 P.M.; twelve hours having been employed in finishing ten miles. After the supper of hungry men we retired to rest, but not to sleep; the sun and wind had sorely burned our hands and faces, our legs ached, and that African plague, spasmodic cramps of the lower limbs, awoke me every half hour.

In the morning the reconnoiters were distinguished from their fellows by hobbling about like cheap screws after a long field-day. Another African plague supervened. In an evil hour I made that march in a pair of loose waterproof boots, which began by softening the feet, and ended by half flaying them. Wounds in these lands are hard to heal; I have heard of a man losing his leg in consequence of a mosquito-bite. Briefly, a hurt which in England would have passed away in a week, wasted thirty days of my precious time.

A variety of expeditions followed this first exploration. Messrs. Calvo and Mann ascended, on the 3rd of January, 1862, Albert Peak; left a maximum and a minimum thermometer there, discovered the V-shaped dyke above alluded to, and returned on the next day prematurely. The cause was the recurrence of Mr. Mann's complaint; a week reduced him so low that he

listened to our advice and accompanied to Victoria the Judge, now homewards bound.

On the 5th of January the Rev. Mr. Saker again joined our party. He had brought up with him Mr. R. Smith, a coadjutor, who eventually became too unwell to venture higher.

On the 13th January, Mr. Saker made the third ascent, and the first boiling of thermometer upon Victoria Peak. He returned on the next day at 6 P.M. sadly tired, and on the 15th January he descended the mountain.

Mr. Mann was as unlucky as I was: fifteen days out of the four months which in these latitudes compose the botanist's year, are a terrible loss. He reappeared in camp on the 25th January, having accomplished the severe ascent from Ridge Camp to Mann's Spring in seven hours. My foot had permitted me to crawl about since the 22nd January, at present one of my lucky days. We made all preparations for a final visit to the summit without delay. The tornado season was setting in: the thunder was now above, not below us; and globular lightning shooting like Roman candles across the path is not pleasant.

At 7 P.M. on the 27th January we set out for the fourth expedition, resolved to pass two nights near the summit. The first day was spent in sketching, taking bearings, and collecting plants; we passed the hours of darkness on Mount Isabel. The next day took us to "Saker's Camp," a cone at the foot of the great mountain: beyond exploring the interior of Victoria Crater, and vainly attempting to measure the circumference of the huge cone, we did nothing. At night the cold caused itself to be felt, the mercury sank to 33.5° Fahrenheit, our waterproofs were white with hoar, and the peak was powdered with frozen dew. And yet there are those who doubt that snow has been seen on the Camaroons Mountain! The minimum thermometer upon the back wall of Albert Crater showed 27° Fahrenheit.

The next day enabled me to make a happy discovery. Mr. Mann and I started by different roads: they had told me it was impossible to ascend the blue slide between Victoria and Albert. The word is naturally somewhat irritating; I resolved, therefore, to try, and agreed to meet my fellow-traveller on the summit. At 2 P.M. we took formal possession of the place; flew the union jack; drank the health of the Sovereign Lady with our last bottle of champagne; and left our names upon a leaden plate, with two sixpences—rather a bright idea, but not emanating from my cranium.

After this ceremony, Mr. Mann returned to camp. I was not satisfied, and wanted something more, especially a view of the country to the north-east and the north-west. Accompanied by my factotum and a krooboy, I climbed up the dyke separating the two great chasms, and walked down a smooth cinder-valley trending north-east between Victoria Crater and the northern wall of Albert Crater. Fortune favoured me with a sight of the utterly unknown land; the wind-driven clouds melted away, and I saw that the land to the north exactly reflects the land to the south. Still disappointed, I turned to the north-west, behind Albert Crater, and observed some suspicious cracks and gashes, long, narrow, and deep, which raised my hopes sky-high; they proved, however, thoroughly extinct, nor could I detect in them the least smell of sulphur. Disappointed, I ascended the highest wall of Albert Crater, where the krooboy was sitting, B.P. thermometer in hand.

Hardly had the candle been lighted when Selim, who had struck over certain dwarf and broken hillocks, stained with red and yellow, and lying due north of where I stood, re-appeared, highly excited. When he told me the cause, his feelings were shared; we started on grand gallop, and presently met our reward.

My factotum had discovered a complete solfaterra. It lies north-north-east of Albert Crater, somewhat below the highest point, and where the downwards slope begins. Smoke arose in puffy volumes from the long lines of white

marl and sulphur which, divided by small ridges of moss, ran in a northern and southern direction. During rainy weather the phenomenon must be seen from the low lands, and perhaps may still be visible from Fernando Po.

This discovery accounts for many detached reports. If, as the guides say, Mont Blanc smokes his pipe, then Ochema's pipe is not yet put out. The fiery mountain noticed by the old Punic navigator; the flames which the people of Bimbia described to Captain Allen as proceeding from the earth; the flashes seen by the cloth merchants at Camaroons River and by the people of Fernando Po, are now satisfactorily explained. I am pleased to announce to the Royal Geographical Society of Great Britain the addition of another volcano, not wholly extinct, to the list of those already known.

Nothing now remained but to descend and dine. On the next day we again separated. Mr. Mann ascended Albert Peak to remove his thermometer, whilst I returned to camp and finished the measurements. The event of the day was a hailstorm, the stones being of a size approaching to the inconvenient. I reached camp at 4 P.M., and my fellow-traveller arrived about an hour afterwards.

All of geographical interest being now ready, on the 31st of January, 1862, I left, not without regret, "Mann's Spring Camp," where so many peaceful happy days, without sand-flies or prickly heat, had sped. The Chief Botani received me with a civility bordering on servility. After leaving his village, however, a fellow in the lower districts presented a musket at my men, hoping to make them run away and cast their loads; they had learned, however, that the danger of being shot was problematical, but that the punishment of desertion was certain. Finally, on the 2nd of February, 1862, I once more saw the scattered bungalows of Victoria, where the kindly Mrs. Saker, who would not leave the place till our safe return, received me with all hospitality.

In concluding this hurried sketch of a highly-interesting region, I must express my regret that my instruments were wholly inadequate to the task. An aneroid is the poorest substitute for the mountain-barometer; I had no hygrometer; and even a clinometer was not at hand.

These few lines will, it is hoped, show the adaptability of the Camaroons Mountain for a sanitarium, a colony, or a convict station. A locale which shows every morning hoar-frost during the hot season in a region removed but 4° from the equator is not to be despised in the days when it is proposed to remove Calcutta to Simla. The Anglo-Scandinavian race cannot, it is true, thrive in all climates: but there are few, and those are valueless, in which choice of site would not make him a cosmopolite.

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12.—*Geological Notes on Campana, in the Province of Esmeraldas, Ecuador.* By JAMES WILSON.

[In communicating the following short letter from Mr. James Wilson, Sir Roderick Murchison makes this comment:—"Although Mr. Wilson (known to geologists and geographers by his explorations in California and Tropical Australia) has not been able to make any extensive surveys in Ecuador, where he has been labouring hard as the surveyor of a land company in the province of Esmeralda, yet the discoveries which he has made of the existence of the works of man in a stratum of mould beneath the sea-level, and covered by several feet of clay—the phenomenon being persistent for 60 miles—is of the highest interest to physical geographers and geologists. These facts seem to demonstrate that, within the human period, the lands on the coast of Central America were depressed and submerged, and that after the accumulation of marine clays above the terrestrial relics the whole coast was elevated to its present position."]